

Birds of montane forest fragments in Chuquisaca Department, Bolivia

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The eastern slopes of the Andes of Bolivia comprise two significantly different regions. In the north the "Yungas" range from La Paz Department southeastwards to the Sibiria watershed near Comarapa at the boundary between Cochabamba and Santa Cruz Departments. In the south the "Valles" encompass large parts of Cochabamba, Chuquisaca, Santa Cruz and Tarija Departments (Fig. 1). Whereas the "Yungas" region is characterized by humid, evergreen forest, the "Valles" region is covered by a mosaic of deciduous forests, shrublands in the partly rain-shadowed inter-Andean valleys, and semi-evergreen forests on cloud-enshrouded scarps. The temperate semi-humid forest habitat in the "Valles" is isolated from that of the Yungas by the semi-arid Cochabamba basin (at 2500 m) and holds far fewer species of birds, probably as a consequence of its isolation and lower humidity



Figure 1. Map of Bolivia and Chuquisaca Department (dotted outline). Vertical hatching: the humid, montane parts of "Yungas" and the semi-humid, montane parts of "Valles".

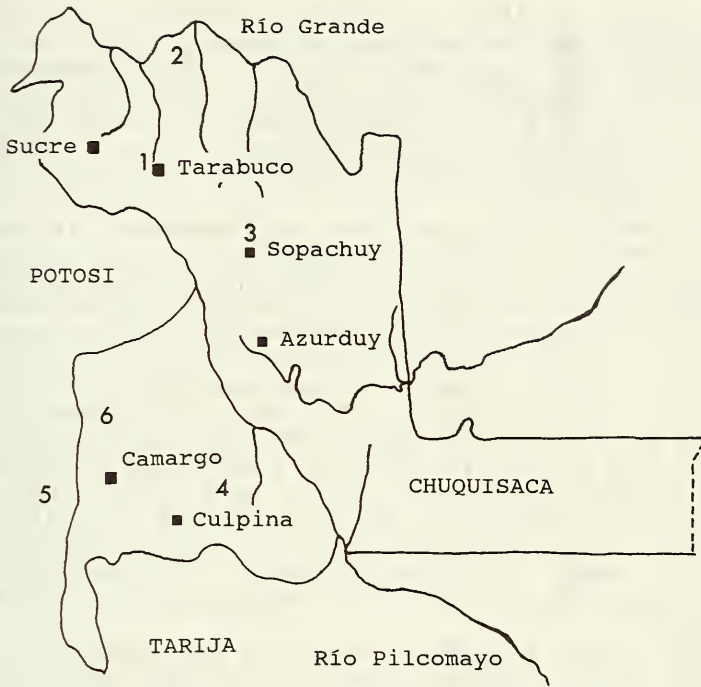


Figure 2. Map of Chuquisaca Department. Squares: cities and principal villages. Numbers 1-6 refer to the localities L1-L6 in the text.

(Fjeldså & Krabbe 1990, Fjeldså & Maijer 1996). The ornithologically least-known department of the "Valles" is Chuquisaca (Fig. 2), the size of Costa Rica, and the only one without any protected areas. As of just seven years ago, only 293 species of birds had been recorded there (Remsen & Traylor 1989). Large tracts of forest still remain in the subtropical zone near Río Grande and south of Azurduy (Fjeldså & Maijer 1996, pers. obs.; Fig. 2). In the temperate zone, however, only small, isolated patches of forest remain, most in remote areas. As a consequence of the rapid disappearance of these poorly known temperate forests, a team from the Zoological Museum, University of Copenhagen (ZMUC), and the Museo Nacional de Historia Natural, Universidad San Andrés, La Paz (MNHN), was encouraged by the newly established Ministerio de Desarrollo Sostenible y Medio Ambiente to collect avifaunal information as part of a basis for future protective measures.

During March and April 1995 the birdlife was investigated in five remnant dry and semi-evergreen forest patches in the temperate zone of Chuquisaca Department and one dry forest in immediately adjacent Potosí Department (Fig. 2). Further records were obtained *en route*

between these sites. Altogether 191 species were recorded. Included in this total and described in further detail below are six altitudinal records, two new departmental records, 38 departmental second records (four documented by tape-recordings and three by specimens for the first time), and nine otherwise noteworthy records. Our high number of second records for Chuquisaca of species that are widespread and common elsewhere illustrates how poorly the avifauna of this region is known.

Of the 293 species listed for Chuquisaca Department by Remsen & Traylor (1989), the major contributions were 150 species recorded by Bond & Meyer de Schauensee (1942, 1943) and 94 recorded by Remsen & Traylor (1983, 1989), and Remsen *et al.* (1985, 1986, 1987). There were few subsequent records (Cabot 1990), until Fjeldså & Maijer in the autumn of 1991 surveyed on foot a 400-km transect of mainly subtropical, but also patches of temperate forests of southern Chuquisaca, and listed sight records of 87 new departmental species (Fjeldså & Maijer 1996). In March 1992 Maijer made another trek from Narvaez in Tarija Department to Villa Charcas in Chuquisaca Department. The results from this trip are included in Fjeldså & Maijer (1996). Unfortunately, the results of Fjeldså & Maijer are published as a report and therefore are of rather difficult access. We thus consider it important to present a complete list of our records. Some records deserve further comments and are dealt with separately.

We also present a detailed description of the habitats to create a reference basis for following the future human impact on this threatened high-altitude ecosystem.

Study areas

L1: 12 road km north-west of Tarabuco, 19°09'S, 64°59'W, 3300–3400 m; 8–10 February and 21–22 March. A c. 50 ha patch of dry *Polylepis tomentella* ssp. *tomentella* (Rosaceae) woodland (Kessler 1995). Tree height: 1–3 m, most individuals 1–2 m. Distance between trees c. 2 m. Kessler (1995) characterized the habitat as open dwarf-forest with a ground coverage of 20%, but locally 90%. Human impact: grazing goats and introduced *Eucalyptus* (Myrtaceae) planted among *Polylepis* in two places. Many trees were sprouting from a thick basis near the ground, indicating previous and recent exploitation, probably for firewood. Laegaard (1992) and Kessler (1995) both stress that man-made fires are the most important factor in the creation and maintenance of puna and páramos below the upper limit of *Polylepis* (c. 4800 m). However, no signs of recent fires were observed in the present habitat.

L2: Cerro Palmarcito, 18°35'S, 64°52'W, 2300–2800 m; 13–18 March. A c. 10 ha stand of the endemic palm *Parajubaea torallyi* (Arecaceae) mixed with evergreen *Podocarpus* (Podocarpaceae) and deciduous forest along a permanent stream. Bordered below by extensive dry *Acacia* (Mimosaceae) forest mixed with columnar, 3 m cacti. The adjacent brushy slopes were dominated by *Dodonea*

(Sapindaceae). Somewhat drier than site 3, more humid than sites 1, 5 and 6. Tree heights: 20–25 m palms, 10–15 m *Podocarpus* and deciduous trees, 8–12 m stands of *Acacia* and 2 m *Dodonaea* bushes. Epiphytes dominated by drought-resistant *Tillandsia usneoides* (Bromeliaceae) and congeners, together with cacti and lichens. Soil gravelly and sandy with a thin layer of dry leaf-litter. Human impact: grazing cows and exploitation of palm nuts evidenced by piles of cracked seeds, clusters of sprouting palmlets and liberation of adult palms by cutting down nearby competing trees.

L3: 9–10 road km north of Sopachuy, 19°26'S, 64°28'W, 2300–2500 m; 23–28 March. Fifty to one hundred hectares of more or less patchy, mostly deciduous forest, including some *Alnus* (Betulaceae) and mixed with many *Podocarpus* trees. Tree height: 10–15 m. Under forest cover a 10–15 cm thick layer of black, organic soil present. Outside forest cover, only heavily disintegrated, leached, red soil or bare rock present. In open areas no sign of regeneration. Human impact: firewood gathering, grazing cattle and goats.

L4: 1.5–2 km south of Portillo, 20°43'S, 64°42'W, 2900–3000 m; 2–5 and 8–10 April. Two patches, each 1–2 ha, of disturbed *Alnus* forest. The patch at 3000 m was fringed at one side by dispersed, old trees of *Polylepis*. Also 4.5 km southeast of Portillo, 20°44'S, 64°41'W, 2500–2600 m. A c. 5 ha *Podocarpus* forest, bordered above by disturbed *Alnus* forest and grassy slopes, below by grassy slopes and a narrow riparian forest. These sites were the most humid of those visited, with some *Podocarpus* trees having thick mats of moss on their branches. Tree heights: 5–6 m *Alnus* and 10–12 m *Podocarpus*, a few as tall as 20 m. Human impact: firewood gathering and grazing sheep, goats and cattle. Shrubby slopes were allowed to regenerate to a certain height before being cut, stacked and burnt on the future pasture.

L5: Parinolqui Pampa, Department of Potosí, 20°44'S, 65°34'W, 3000–3100 m; 6–8 April. c. 50–75 km² of dry, thorny *Prosopis ferox* (Mimosaceae) woodland on level and slightly undulating ground. Tree height: 2–3 m *Prosopis*, some 4–5 m. Width of crowns 3–7 m and distance between crowns 1–15 m, but often only 5–7 m. Many *Tillandsia* epiphytes on the terminal branchlets. The understory composed of grass, herbs and cacti. Distribution of size classes of trees rather homogeneous, suggesting human impact. Grazing cattle were observed in the lower undulating parts, and two trucks seen loaded with firewood undoubtedly came from Parinolqui Pampa, the only forested area in the region.

L6: Cerro Huayra Huasi, 20°22'S, 65°08'W, 3450 m; 10–11 April. c. 50 km² of *Polylepis tomentella* ssp. *tomentella* (Kessler 1995) dwarf woodland on nearly bare soil in a very dry region. Tree height: 1–2 m, some 3–4 m. In a few places trees were 2–4 m apart, but generally they were further apart. Human impact: trees cut down in the past and present, probably for firewood. Some regeneration now occurs from the stumps. Grazing sheep and goats.

L7: Río Grande-Sucre along road from Cochabamba (89 km), 1500–2000 m; 7 March. Scattered, dry vegetation.

L8: Sucre–Tarabuco (63 km), 2900–3300 m; 8 March. Arid, open country with scattered grain fields.

L9: Tarabuco–Presto (35 km), 2500–3300 m; 11 March. Arid, open country with scattered trees, scrub and grain fields.

L10: Presto–Rodeo (40 km), 2500–3700 m; 11–12 March. Riparian arable land, quebradas with small patches of *Podocarpus*, *Alnus* and shrubs.

L11: Rodeo–Molani including Molani (12 trail km), 2500–3400 m; 12–13 and 18–19 March. Farmland and an 800 m long, narrow stream-side thicket of *Podocarpus* and *Alnus*, mixed with scattered *Parajubaea torallyi* palms.

L12: Molani–Cerro Palmarcito, 1600–2500 m; 13 and 18 March. Dry, thorny forest with cattle.

L13: Tarabuco–Zudañes (48 km), 2000–3300 m; 22 and 28 March. Arid, open country with scattered trees and bushes. Several steep, rocky canyons.

L14: Zudañes–Tomina (43 km), 2100–2500 m; 22 and 28 March. Arid, open country with scattered trees and bushes. The road passes along the edge of a large area of only slightly disturbed, subtropical dry forest.

L15: Tomina–San Pedro (62 km), 1800–2100 m; 22 and 28 March. Semi-humid farmland with riparian bushes and trees. In some places patches of semi-humid forest.

L16: Sucre–20 km south of Puna (180 km), turnoff from Potosi at km 131, 2800–3700 m; 31 March and 12 April. Open, arid country.

L17: Pond 20 km south of Puna at 19°52'S, 65°33'W, 3450 m; 31 March and 12 April.

L18: 25 km south of Otavi, at 20°12'S, 65°14'W, 3360 m; 1 April. Fairly open thorny scrub mixed with a few cacti and trees.

L19: Culpina–Incahuasi (12 km), 2900–3000 m; 1, 5, 8 and 11 April. Dry quebrada with bare ground and scattered bushes. Irrigated farmland on plain around Incahuasi.

L20: Incahuasi–Portillo (37 km); 3000–3600 m; 1, 2, 8 and 11 April. Open, arid country with thin grass-cover. A few scattered patches of semi-humid *Alnus* shrubbery near Portillo.

L21: Camargo–El Puente on Cotagaita road (45 km), 2500 m; 6 April. Large riparian trees, mainly *Schinus molle*. Vineyards.

L22: Department of Potosi: Cotagaita–Cancha Pata Pampa (61 km), 2600–3000 m; 6–7 April. Dry, sandy area with cacti, thorny brush and scattered trees.

Species list

Abundances estimated for the six forest patches: X (one record only, status uncertain), R (rare, only recorded a few times, always in small numbers (<10 individuals)), U (uncommon, recorded most days, but always in small numbers), FC (fairly common, recorded daily in small numbers), C (common, recorded (seen or heard) daily in fairly large numbers (>10 individuals)). For other localities the actual number seen is given in parenthesis. The large number of second records from the

TABLE 1

Andean humid and semi-humid forest species that are distributed in the "Yungas" and across the semi-arid Cochabamba basin to "Valles" (Yungas-Valles), or are endemic to southern Bolivia/northern Argentina (Boliviano-Tucumano). Some of these species are chiefly submontane, but they all reach as a minimum the lower limit of the montane zone (2300–2500 m)

Species	Yungas-Valles	Boliviano-Tucumano
<i>Penelope dabbeni</i>		X
<i>Columba fasciata</i>	X	
<i>Amazona tucumana</i>		X
<i>Glaucidium jardinii</i>	X	
<i>Eriocnemis glaucopoides</i>		X
<i>Piculus rubiginosus</i>	X	
<i>Synallaxis azarae</i>	X	
<i>Knipolegus signatus</i>	X	
<i>Pyrrhomyias cinnamomea</i>	X	
<i>Mecocerculus leucophrys</i>	X	
<i>Troglodytes solstitialis</i>	X	
<i>Myioborus brunniceps</i>		X
<i>Thlypopsis ruficeps</i>	X	
<i>Chlorospingus ophthalmicus</i>	X	
<i>Atlapetes torquatus</i>	X	
<i>Atlapetes fulviceps</i>		X
<i>Poospiza erythrophrys</i>		X

department are marked with an asterisk and followed by the reference to the first record.

Specimens are deposited in Colección Boliviano de Fauna (CBF), a section of MNHN, or in ZMUC, abbreviations which precede the catalogue number in the species list. A "b", appended to the locality, indicates that no specimen, but at least one blood sample was obtained. All blood samples are deposited at the ZMUC and are available to researchers (see Arctander & Fjeldså 1994). The sequence of species follows Meyer de Schauensee (1970).

Table 1 lists Andean humid and semi-humid forest species that are distributed from "Yungas" into "Valles", or are endemic to "Valles" and the Tucuman Province of northern Argentina. Some of these species are chiefly submontane, but all species reach as a minimum the montane zone (lower limit 2300–2500 m). More details about the southward reduction in numbers of humid forest species can be found in Fjeldså & Maijer (1996).

Nothoprocta pentlandii L1 X, L3 FC; L4 FC; L11 (2); L13 (1); L15 (1); 2350–2800 m. *Nothoprocta ornata** Cabot & Serrano (1988). L1 U; L6 X; 3350–3500 m. *Nothura darwinii* L1 U; L3 U; L4 U; L15 (1); 2250–3350 m. *Anas flavirostris* L17 (2 with pull. 31/3). *Syrigma sibilatrix** Fjeldså & Maijer (1996). L15 (5). *Theristicus melanopsis* L7 (22 road km south of Río Grande) (2); 1800 m. *Vultur gryphus* L1 U; L2 FC; L3 R; L4 U; L11 (2); L16 (1); L22 (1); 2300–3400 m. *Cathartes aura* L3 U; L4 U; L8 (2); L11 (1); L12 (U); L13 (3); L14 (2); L15 (5);

L19 (1); L21 (1); L22 (2); 2300–3100 m. *Coragyps atratus** Fjeldså & Maijer (1996). L2 (6); L10 (20); L15 (1); 1800–2100 m. *Sarcocaulophus papa** Fjeldså & Maijer (1996). L2 U; 2700 m. *Accipiter cf. ventralis* L2 U; L4 X; L15 (2); 2000–2500 m. *Buteo cf. polyosoma* L4 U; L5 U; L6 R; L19 (2); L20 (1); L22 (1); 2800–3100 m. *Buteo maguirostris* L3 U; 2300–2400 m. *Buteo brachyurnus*?* Fjeldså & Maijer (1996). L12 R; 1600 m. *Geranoaetus melanocephalus* L2 FC; L4 U; L8 (1); L10 (3); L18 (1); 2300–3360 m. *Buteogallus urubitinga** Remsen et al. (1985). L2 R; 2500 m. *Circus cinereus* L13 (1); L16 (76, 133, 136 and 162 km from Sucre) (4); L19 (2); 3000–3200 m. *Phalcoboenus megalopterns** Cabot & Serrano (1988). L4 U; L6 U; L15 (2); L20 (2); L22 (1); 2000–3500 m. *Polyborus plancus* L3 U; 2300–2500 m. *Falco peregrinus* L19 (1); 3000 m. *Falco femoralis* L5 U; L11 (2); L12 R; L20 (3); 2500–3420 m. *Falco sparverius* L2 FC; L7 (1); L11 (2); L15 (2); L21 (1); 2000–2500 m. *Peulope dabbevei* L2 U; L3 U; L4 FC; 2300–3000 m. *Vauellus resplendens* L19 (1); L22 (1); 3000 m. *Charadrius collaris* L17 (1 31/3); 3450 m. *Phrivalis douiuicns* L17 (6 31/3, 10 12/4), 3450 m. *Oreopholus ruficollis** Fjeldså & Maijer (1996). 8 km north of Otavi (12); 3400 m. *Calidris bairdii* L17 (2 31/3, 35 12/4); 3450 m. *Tringa melanoleuca* L17 (4 31/3, 7 12/4); 3450 m. *Tringa flavipes* L17 (4 12/4); 3450 m. *Phalaropus tricolor* L17 (88 12/4); 3450 m. *Himantopus himantopus* L17 (4 31/3, 7 12/4); 3450 m. *Columba fasciata** Fjeldså & Maijer (1996). L2 U; L3 FC; L4 C; L11 (7); L15 (30); 2300–3000 m. *Columba maculosa* L1 U; L6 U; L7 (1); L10 (4); L11 (8); L15 (4); L22 (2); 2000–3400 m. *Zenaidura macroura* L2 C; L3 FC; L4 FC; L6 FC; L9 (2); L11 (7); L14 (4); L15 (7); L19 (3); L21 (4); 2300–3500 m. *Leptotila verreauxi* L2 C; L3 FC; L4 FC; L7 (4); L9 (1); L11 (3); L21 (1); L22 (1); 1800–3000 m. *Leptotila megalura* L15 (3); 1800–2200 m. *Columbina picui* L2 FC; L4 FC; L7 (1); L12 (6); L13 (2); L14 (11); L15 (27); L19 (2); L20 (7); L21 (2); 1600–3000 m. *Metriopelia ceciliae* L2 U; L9 (2); L11 (3); L13 (6); L14 (2); L21 (1); 2500–3000 m. *Metriopelia melanoptera* L1 U; L4 FC; L5 C; L6 FC; L17 (1); L18 (3); L20 (4); L22 (5); 2800–3500 m. *Ara rubrogeys* L2 U, L11 (9); 2000–2600 m. *Aratinga mitrata* L2 C; L11 (>100); L12 (>50); 1800–2500 m. *Aratinga acuticauda* L3 C; L10 (19); L11 (20); L12 (>150); L15 (60); 1600–2500 m. *Pyrrhura molina* L4 U; 2500 m. *Bolborhynchus aurifrons* L6 FC; 3400–3450 m. *Bolborhynchus aymara* L2 FC; L4 U; L5 FC; L9 (heard); L10 (3); L11 (14); L13 (8); L14 (4); L21 (3); L22 (11); 2200–3100 m. *Amazona tucumana* L2 U; L4 C; L11 (2); 2300–2700 m. *Coccyzus americanus* L15 (1 23/3); 2100 m. *Guira guira** Remsen et al. (1986). L15 (10); 2250 m. *Piaya cayana* L12 (2); 2100–2200 m. *Otus choliba* L2 U; 2300–2400 m. *Otus hoyi** Fjeldså & Maijer (1996). L3 X; L4s (ZMUC 91843) X; 2300–2500 m. *Glaucidium jardiui* L4 X; 3000 m. *Athene cunicularia* L5 X; 3100 m. *Caprimulgus longirostris** Fjeldså & Maijer (1996). L4 X; 2500–3000 m. *Streptoprocne zonaris* L3 X; 2500 m. *Aeronautes andecolus* L2 U; L3 X; L5 X; L11 (43); L12 (3); L13 (10); L21 (1); 2400–3100 m. *Colibri coruscans* L1b FC; L2 U; L4 U; L6 R; L10 (3); L20 (2); 2500–3400 m. *Colibri serrirostris* L2 X; 2700 m. *Amazilia chionogaster* L2b FC; L3b FC; L11 (1); L15 (1); L21 (1); 2100–2500 m. *Oreotrochilus estella** Fjeldså & Maijer (1996). L4 U;

L6 FC; 2900–3500 m. *Oreotrochilus adela* L1 R; L6 R; 3350–3450 m. *Patagona gigas* L1 FC; L4 FC; L5 U; L18 (1); L22 (1); 2800–3400 m. *Eriocnemis glaucopoides* L4 (CBF 02779) FC; 2500 m. *Sappho sparganura* L1 FC; L2b FC; L3b FC; L4 FC; L6 U; L8 (1); L11 (1); 2300–3500 m. *Microstilbon burmeisteri* L2 R; L3 (CBF 02780) U; L4 U; 2300–2500 m. *Nystalus maculatus* L10 (1); L12 (1); L14 (1); L15 (1); 2000–2600 m. *Picumus dorbyguianus* L2 U; L3 X; 2300–2400 m. *Colaptes rupicola* L1 U; L2 U; L5 U; L16 (4); L20 (3); 2700–3300 m. *Colaptes melanolaimus* L4 U; L21 (1); 2500–3000 m. *Piculus rubiginosus* L4 X; 3000 m. *Melanerpes cactorum** Remsen et al. (1986). L12 (1); L14 (1); 1800–2000 m. *Veniliornis frontalis* L3 (CBF 02781) U; L4 (CBF 02782) U; 2300–2500 m. *Picoides lignarius* L4 U; L5 U; L12 X; 2200–3100 m. *Campephilus leucopogon** Fjeldså & Maijer (1996). L3 R; 2450 m. *Geositta tenuirostris* L4 U; 3100 m. *Geositta rufipennis** Cabot (1990). L1 U; L6 X; L18 (2); 3300–3400 m. *Geositta cucularia* L8 (2); L13 (3); L17 (1); L19 (2); 3000–3450 m. *Cinclodes fuscus* L1 U; L4 R; L6 U; L19 (1); L20 (2); 2800–3450 m. *Cinclodes atacamensis** Fjeldså & Maijer (1996). L6 U; 3400–3500 m. *Upucerthia jelskii** Fjeldså & Maijer (1996). L5 U; L6 U; 3100–3500 m. *Upucerthia andaecola* L1 FC; L4 FC; L6 FC; L10 (2); L18 (1); L20 (1); 2600–3500 m. *Upucerthia harterti* L2 (CBF 02783) FC; L11 (2); 2350–2500 m. *Furnarius rufus* L1 U; L3 U; L9 (2); L11 (7); L12 R; L14 (1); L15 (5); L19 (2); L21 (3); 1600–3350 m. *Leptasthenura aegithaloides** Remsen et al. (1986). L6 (CBF 02784) FC; 3400–3500 m. *Leptasthenura yanacensis** M. Kessler in Fjeldså & Maijer (1996). L6 R; 3450–3500 m. *Leptasthenura fuliginiceps* L1 FC; L4 FC; L5 X; 2800–3400 m. *Synallaxis frontalis* L2 (CBF 02785) FC; 2400 m. *Synallaxis azarae* L3 (CBF 02786) FC; L4 U; 2300–3000 m. *Cranioleuca pyrrhophia* L2b C; L3 (ZMUC 91742, CBF 02787) C; L4 C; L5 (ZMUC 91741) U; 2300–3100 m. *Asthenes dorbignyi* L1 FC; L2 R; L4 FC; L5 (ZMUC 91747) C; L6 FC; L10 (5); L11 (3); L13 (3); L14 (1); L18 (ZMUC 91748) (2); L22 (CBF 02788) (7); 2500–3500 m. *Asthenes wyatti** Fjeldså & Maijer (1996). L1 U; 3400 m (song and calls tape-recorded). *Phacellodomus maculipectus* L2 U; L3 (ZMUC 91752, CBF 02789) FC; L4 (ZMUC 91751) FC; 2300–3000 m. *Phacellodomus striaticeps* L1 FC; L4 FC; L5 (ZMUC 91753–54, CBF 02790) FC; L6 FC; L8 (2); L11 (7); L12 U; L13 (4); L22 (2); 2500–3500 m. *Thamnophilus caerulescens* L3 FC; 2300–2500 m. *Thamnophilus ruficapillus* L2 FC; L3 FC; L11 (2); 2300–2550 m. *Scytalopus superciliaris zimmeri* L4 (ZMUC 91755–57, CBF 02791) FC; 2500–3000 m. *Melanopareia maximiliani* L2 FC; L3 U; L4 FC; L11 (8); 2300–3000 m. *Pachyramphus polychopterus* L2 U; L3 FC; 2300–2500 m. *Pachyramphus validus* L2 R; L4 X. 2500–3000 m. *Phytotoma rutila* L5 U; L6 U; L9 (2); L14 (1); L15 (3); L18 (5); L19 (1); 2000–3450 m. *Agriornis montana* L4 FC; L6 X; L8 (2); L9 (1); L11 (1); L19 (1); L20 (2); 2800–3500 m. *Muscisaxicola cinerea* L20 (CBF 02790, 20°41'S, 64°47'W) (4); 3250 m. *Muscisaxicola rufivertex** Fjeldså & Maijer (1996). L6 X; 3400 m. *Muscisaxicola maculirostris** Cabot (1990). L1 U; L5 C; L6 FC; L18 (1); L22 (2); 3100–3500 m. *Polioptila rufipennis** Fjeldså & Maijer (1996). L1 U; 3400 m. *Knipolegus aterrimus* L1 R; L2b FC; L3 FC; L4

U; L5 C; L10 (3); L11 (6); L14 (3); L15 (7); L21 (1); L22 (6); 2000–3350 m. *Knipolegus signatus* L3 (CBF 02795) U; L4 U; 2300–2900 m. *Ochthoeca oenanthoides** Remsen et al. (1987). L1 FC; L5 C; L6 (CBF 02794) FC; L20 (2); 3100–3500 m. *Ochthoeca leucophrys* L1 FC; L4 FC; L6 (CBF 02794) FC; 3000–3450 m. *Satrapa icterophrys* L2 R; 2500 m. *Suiriri suiriri* L12 (2); 2200 m. *Tyrannus melancholicus** Fjeldså & Maijer (1996). L3 U; L7 (1); L12 (1); L15 (4); L21 (1); 1700–2500 m. *Pitangus sulphuratus* L7 (1); L15 (8); 2000–2250 m. *Empidonomus aurantioatrocristatus* L12 (1); 2200 m. *Myiarchus tuberculifer* L2 R; L3 U; L4 FC; 2400–3000 m. *Myiarchus tyrannulus* L12 (3); 1800–2200 m. *Pyrrhomyias cinnamomea* L2 FC; L3 FC; L11 (1); 2300–2500 m. *Myiophobus fasciatus* L2b FC; L3b FC; 2300–2500 m. *Hirundinea ferruginea* L2 FC; L4 U; L10 (1); L12 (3); L13 (2); L15 (5); L21 (3); 1800–2800 m. *Stigmatura budytoidea* L2b FC; L11 (1); L12 (16); 1800–2500 m. *Anairetes parulus** Fjeldså & Maijer (1996). L1 U; L4 U; L6 FC; 3000–3500 m (dawn song tape-recorded at L1). *Anairetes flavirostris* L1 U; L4 U; L5 FC; L11 (3); L18 (1); L22 (1); 2500–3300 m. *Hemitriccus margaritaceiventer* L2 (CBF 02796) U; 2400 m. *Mecocerculus leucophrys* L2b FC; L3b FC; L4 C; L6 R; L11 (7); 2300–3000 m. *Mecocerculus hellmayri* L2 (CBF 02799) U; L3 (ZMUC 91749, CBF 02800) FC; L4 FC; L20 (1); 2300–3000 m. *Phylloscartes ventralis* L3 (CBF 02797) U; 2300 m. *Sublegatus modestus*? L12 (3); 1800–2200 m. *Elaenia albiceps* L1b U; L2 (CBF 02801) C; L3 (ZMUC 91758–59) C; L4 FC; L10 (3); L11 (13); L12 (5); L22 (2); 2200–3350 m. *Elaenia parvirostris* L3s (ZMUC 91760) X; L4 U; 2300–2500 m. *Elaenia strepera* L2 (ZMUC 91761, CBF 02802) FC; L3 (CBF 02803–5) FC; L11 (2); 2300–2400 m. *Camptostoma obsoletum* L2 (CBF 02798) (1); L3 U; L15 (1); 2000–2300 m. *Notiochelidon cyanoleuca** Cabot (1990). L3 FC; L9 (15); L10 (1); L11 (5); L13 (3); L14 (17); L15 (2); 2300–2500 m. *Petrochelidon pyrrhonota* L19 (11/4) (1). *Petrochelidon andaecola* L2 C; L13 (1); 2700 m. *Cyanocorax chrysops* L2 U; L4 U; L12 (4); 1700–2500 m. *Troglodytes aedon* L3b FC; L4 U; L11 (2); L22 (3); 2300–3000 m. *Troglodytes solstitialis* L4 FC, 2500–3000 m. *Mimus dorsalis* L5 FC; L8 (1); L9 (3); L13 (3); L19 (1); L22 (3); 2300–3100 m. *Turdus chiguanco* L1b FC, L2 FC; L3 U; L4 FC; L6 U; L8 (2); L9 (1); L11 (2); L13 (3); L14 (1); L15 (4); L20 (1); L22 (1); 2000–3450 m. *Turdus nigriceps* L2 U; L3 (ZMUC 91738, CBF 02806–7) FC, L4 FC; 2300–2500 m. *Turdus rufiventris* L3 X; L15 (1); 2250–2300 m. *Turdus amaurochalinus* L2b FC; L15 (4); L21 (1); 2000–2400 m. *Polioptila dumicola* L2 FC; L12 (6); L14 (1); 1600–2400 m. *Anthus correndera* L20 (2); 3200 m. *Cyclarhis gujanensis* L2 U; L3 U; L4 U; L12 (3); 1600–3000 m. *Vireo olivaceus** Remsen et al. (1987). L2b FC; L3b U; 2250–2400 m. *Molothrus* cf. *bonariensis* L15 (2); 2200 m. *Molothrus badius* L1 U; L3 U; L6 U; L9 (5); L10 (10); L11 (4); L13 (5); L14 (4); L15 (11); L18 (5); L19 (10); 2300–3400 m. *Oreopsar bolivianus* L9 (c. 20 road km north of Tarabuco) (6); L13 (ZMUC 91739, 19°05'S, 64°51'W, 2750 m) (6); L16 (km 18, 68 and 74 from Sucre) (11); 2500–2750 m. *Icterus chrysopterus** Fjeldså & Maijer (1996). L4 U; 2500 m. *Myioborus brunniceps* L2 (CBF 02808) C; L3b C; L4 FC; L11 (3); L15 (1);

2000–3000 m. *Diglossa sittoides* L1 U; L4 U; 2900–3350 m. *Oreomanes fraseri* L1 U; 3300–3400 m. *Pipraeidea melanonota* L3 (CBF 02809) FC; L4 FC; 2300–3000 m. *Thraupis bonariensis* L1 U; L2 FC; L3b FC; L4 FC; L5 U; L6 R; L9 (2); L11 (3); L14 (1); L15 (2); L18 (3); 2250–3360 m. *Thraupis sayaca* L2 (CBF 02810) FC; L3b FC; L14 (2); L15 (9); 1800–2500 m. *Piranga flava* L12 (1); 2200 m. *Thlypopsis ruficeps* L3 FC; L4 FC; 2400–3000 m. *Chlorospingus ophthalmicus* L3 FC; L4 (CBF 02811) FC (only in *Podocarpus*); L11 (2); 2300–2500 m. *Saltator aurantiirostris* L1 FC; L2b FC; L3b C; L4 U; L5 U; L6 U; L9 (2); L10 (4); L11 (15); L12 (1); L14 (1); L15 (9); L21 (1); 1600–3400 m. *Saltator rufiventris** Fjeldså & Maijer (1996). L4 (CBF 02812) U; 2800–3000 m. *Pheucticus aureoventris* L2 FC; L4 U; L11 (2); 2400–3000 m. *Sporophila caerulescens** Fjeldså & Maijer (1996). L2b C; L3b C; L11 (9); L14 (1); L15 (7); 2300–2500 m (song tape-recorded at L2 and L3). *Catamenia inornata** Fjeldså & Maijer (1996). L1 U; L4 U; 2800–3400 m (song tape-recorded at L4). *Catamenia analis* L1 FC; L2 U; L3 U; L4 FC; L6 R; L10 (15); L11 (10); L18 (1); L20 (1); 2500–3400 m. *Sicalis olivascens** Remsen et al. (1987). L1 FC; L4 U; L6 FC; L8 (3); L9 (8); L10 (3); L11 (5); L13 (10); L20 (2); 2500–3450 m. *Sicalis luteocephala* L1 (CBF 02813–14) U; L5 R; L6 X; L9 (7 sites) (23); L10 (4 sites) (24); L11 (2); L13 (ZMUC 91744–45) (3 sites) (>10); L19 (ZMUC 91743, CBF 02815) (3 sites) (18); L20 (3 sites) (13); 2500–3400 m. *Sicalis flaveola* L2 FC; L3 FC; L8 (10); L9 (5); L11 (3); L12 (17); L13 (5); L14 (8); L15 (36); L19 (2); L22 (2); 1600–2500 m. *Phrygilus atriceps* L1 U; L6 FC; L11 (2); L18 (3); L22 (2); 2500–3450 m. *Phrygilus plebejus** Remsen et al. (1987). L1 C; L4 FC; L5 C; L6 FC; L8 (5); L10 (7); L13 (10); L18 (4); L20 (11); L21 (2); L22 (9); 2800–3500 m. *Phrygilus unicolor* L4 R; L6 FC; 3000–3500 m. *Phrygilus alaudinus* L1 FC; L3 R; L4 R; L8 (2); L19 (2); L20 (3); 2400–3350 m. *Phrygilus fruticeti** Remsen et al. (1987). L1 FC; L5 R; L6 U; L18 (3); 3300–3450 m. *Diuca diuca** Fjeldså & Maijer (1996). L5 (ZMUC 91746) C; L18 (CBF 02816) (8); 3100–3360 m. *Lophospingus griseocristatus* L2 U; L3b C; L5 FC; L7 (2); L9 (1); L11 (2); L14 (4); L15 (35); L21 (40); L22 (5); 2000–3100 m. *Atlapetes fulviceps* L2 U; L3b FC; L4 C; L11 (2); 2300–3000 m. *Buarremon (Atlapetes) torquatus* L3b U; L4 FC; 2300–2500 m (change of genus: see Remsen & Sol Graves in press). *Zonotrichia capensis* L1 C; L2 FC; L3 C; L4 C; L5 FC; L6 FC; L10 (8); L11 (18); L12 (15); L13 (>35); L14 (5); L15 (12); L18 (2); L20 (7); 1800–3500 m. *Arremon flavirostris* L2 (ZMUC 91740, CBF 02820) U; 2400 m. *Ammodramus humeralis* L2 FC; 2400 m. *Poospiza hypochondria* L1 FC; L4 FC; L6 R; L10 (1); L11 (4); L14 (2); L20 (1); 2000–3350 m. *Poospiza torquata* L2 (CBF 02818) FC; L3 FC; L11 (2); 2300–2500 m. *Poospiza melanoleuca* L2 (CBF 02819) U; 2250–2500 m. *Poospiza nigrorufa* L2 U; L3 (ZMUC 91750, CBF 02817) FC; L15 (6); 2300–2500 m. *Poospiza erythrophrys* L2 U; L3 FC; L4 FC; 2400–3000 m. *Embernagra platensis* L4 R; L10 (1); L11 (2); 2500–2800 m. *Carduelis magellanica* L1 C; L2b C; L3 C; L4 FC; L5 FC; L6 FC; L11 (11); L13 (5); L14 (3); L15 (8); L18 (5); L19 (2); L20 (3); L22 (3); 2200–3500 m. *Carduelis atrata** Fjeldså & Maijer (1996).

L1 U; 3350 m. *Passer domesticus* L19 (plain north of Incahuasi) (1); Culpina C; Camargo C; 2440–3000 m.

Noteworthy records

WHISTLING HERON *Syrigma sibilatrix*

On 28 March a flock of 5 was seen foraging on locusts 15 road km north of Sopachuy (c. 19°24'S, 64°28'W) on a pampa at 2500 m. Previously recorded up to 1700 m on the Andean slope in southern Bolivia (Fjeldså & Maijer 1996).

RED-FACED GUAN *Penelope dabbeni*

No observations in Bolivia have been published of the species since Bond & Meyer de Schauensee (1943) reported it from only four localities in the country. However, Fjeldså & Maijer (1996) encountered the species daily at 1700–2700 m in Chuquisaca and also estimated the population size north of Río Pilcomayo.

BLACK-NECKED STILT *Himantopus himantopus*

First record from Potosí Department.

RED-FRONTED MACAW *Ara rubrogenys*

Nine individuals of this threatened CITES Appendix I parrot, numbering only a few thousands (possibly only a thousand) (Collar *et al.* 1992), were seen on 13 March at 2500 m near Molani. On 14 March six birds were seen between Molani and Palmarcito, four on 15 March at Palmarcito, five on 16 March at Palmarcito, two on 18 March between Palmarcito and Molani and three on 19 March at Molani. All observations were of pairs or singles. The main distribution is within Cochabamba Department, and a recent study provides numbers, distribution and information on ecology within this area (Christiansen & Pitter 1992–1993a,b, Pitter & Christiansen 1995).

ALDER PARROT *Amazona tucumana*

In early April we observed daily a flock of 80 in the *Podocarpus* forest near Portillo. Fjeldså & Maijer (1996) saw 900 roosting in March 1992 in these mountains (Monte Chapeados). A group of 6 was observed closely for an hour. A constantly begging juvenile was regularly fed by at least one of the adults, which all appeared to feed entirely in the tips of *Podocarpus* branches. Alder Parrot is a CITES Appendix I south Bolivian/Tucuman forest endemic. Published records from Bolivia comprise only the observations of Fjeldså & Maijer (1996) and two localities by Bond & Meyer de Schauensee (1942).

CLOUD-FOREST SCREECH-OWL *Otus hoyi*

One specimen (ZMUC 91843) of this newly described species (König & Straneck 1989) was obtained on 9 April 1995, the first specimen from Chuquisaca. Fjeldså & Maijer (1996) listed the few

existing skins and discussed the species' affinities with Tropical Screech-Owl *Otus choliba*.

BLUE-CAPPED PUFFLEG *Eriocnemis glaucopoides*

In mature *Podocarpus* forest at L4. It had not previously been recorded from this habitat (Fjeldså & Krabbe 1990, Fjeldså & Maijer 1996).

SPOT-BACKED PUFFBIRD *Nystalus maculatus*

One was seen on 11 March 1 km due north of Presto at 2600 m, the highest known elevation for the species. The species is widespread in adjacent lowlands and ascends to above 2000 m and rarely to 2300 m (Fjeldså & Maijer 1996). The only other records for Chuquisaca are 30 km SE Carandayti (Remsen *et al.* 1986) and a few seen September 1991 in thornscrub in the hills on both sides of Río Pilcomayo (Fjeldså & Maijer 1996).

GOLDEN-OLIVE WOODPECKER *Piculus rubiginosus*

One male was carefully described at L4 in a patch of *Alnus* at 3000 m. The species is primarily premontane and ascends at least to 2300 m in Peru and Yungas of Bolivia, but its elevational distribution is poorly known in Valles of s Bolivia and the similar Tucuman of nw Argentina (Fjeldså & Krabbe 1990).

CREAM-BACKED WOODPECKER *Campephilus leucopogon*

Seen on 28 March at 2450 m at L3. Previously known up to 1730 m (Tarija Department) and only from a single locality at 1150 m in Chuquisaca (Fjeldså & Maijer 1996).

WHITE-BROWED TAPACULO *Scytalopus superciliaris zimmeri*

Before the fieldwork of Fjeldså & Maijer (1996), known only from four specimens and one locality in Chuquisaca (Bond & Meyer de Schauensee 1940, 1942, Peters 1951). Fjeldså & Maijer (1996) found this endemic form to be widespread, but not abundant, in the semi-humid zone of southern Chuquisaca and Tarija Departments. We collected four specimens (CBF 02791, ZMUC 91755-7) accompanied by tape-recordings and blood samples, including the first known juvenile (ZMUC 91755), at L4, at 2500 m in *Podocarpus* and at 2900-3000 m in *Alnus* forest and immediately adjacent bunch-grass.

PEARLY-VENTED TODY-TYRANT *Hemitriccus margaritaceiventer*

One of a presumed pair observed was collected (CBF 02796) on 16 March (L2) at 2400 m. Previously known up to *c.* 2000 m (Ridgely & Tudor 1994).

GIANT CONEBILL *Oreomanes fraseri*

Three small groups seen at L1 on 8, 10 and 22 March 1995 are the first records from Chuquisaca. The species is fairly widespread, but vulnerable due to restriction to *Polylepis* forests, which are heavily fragmented from human exploitation.

RUFOUS-BELLIED SALTATOR *Saltator rufiventris*

Three were seen in and around the *Alnus* patch at Portillo on 10 April. Fjeldså & Maijer (1996) found this rare and threatened bird (Collar *et al.* 1992) at a few localities in Chuquisaca. One specimen collected (CBF 02812) on 8 April 1995 in a hedge around a vegetable garden at Portillo represents the first specimen from the department.

CITRON-HEADED YELLOWFINCH *Sicalis luteocephala*

In contrast to its local distribution in Cochabamba Department (Fjeldså & Krabbe 1990), this species is fairly common and widespread in the drier parts of Chuquisaca, where we recorded it at 23 different sites. It was previously known from only 16 sites, the majority in Cochabamba (Fjeldså & Krabbe 1990, Fjeldså & Maijer 1996). We saw them both in and away from villages, always in areas with some denudation of the soil and shallow, narrow quebradas, where they nested in holes. They were also seen nesting in stony bridges and rock crevices. Although most adults were feeding nestlings, one was constructing a nest on 22 March; the two females collected (CBF 02814, 02815) on 10 March and 5 April had brood patches, and a barely fledged juvenile (ZMUC 91745) was collected on 22 March.

COMMON DIUCA-FINCH *Diuca diuca*

Barely fledged young collected (CBF 02816) at L18 on 1 April and at L5 on 7 April (ZMUC 91746), prove breeding in Bolivia, and include the first specimen for Chuquisaca. The only other Bolivian records are specimens from Oploca, Potosí Department (Ridgely & Tudor 1989) and sight records from Culpina in Chuquisaca (Fjeldså & Maijer 1996).

GRASSLAND SPARROW *Ammodramus humeralis*

Five singing birds were seen and tape-recorded in open tall grassland at 2500 m on 13 and 18 March 1995. In Venezuela known up to 1750 m (Meyer de Schauensee & Phelps 1978), elsewhere not above 1100 m (Ridgely & Tudor 1989).

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